May 1st, 10:30 AM - 12:00 PM

Shoreline Monitoring Toolbox: Development and Goals for Implementation

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Process-based assessments for local restoration planning

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Why process-based restoration?

- Organisms are adapted to local habitat conditions
- Habitats are dynamic in space and time

Beechie et al. 1996, Beechie and Bolton 1999

Why process-based restoration?

Endangered Species Act

Purpose: Conserve ecosystems upon which listed species depend

Clean Water Act

Purpose: Restore and maintain the physical, chemical, and biological integrity of the nation’s waters

Process-based restoration

- Goal:
  - Re-establish processes that sustain river and floodplain ecosystems
- Key features:
  - Not static – allows river dynamics
  - Self-sustaining – low maintenance cost
  - Allows natural biodiversity to emerge

The process-based principles

1. Treat root causes of ecosystem change
2. Target local restoration potential
3. Match the scale of restoration with the scale of physical and biological problems
4. Be explicit about expected outcomes and recovery time

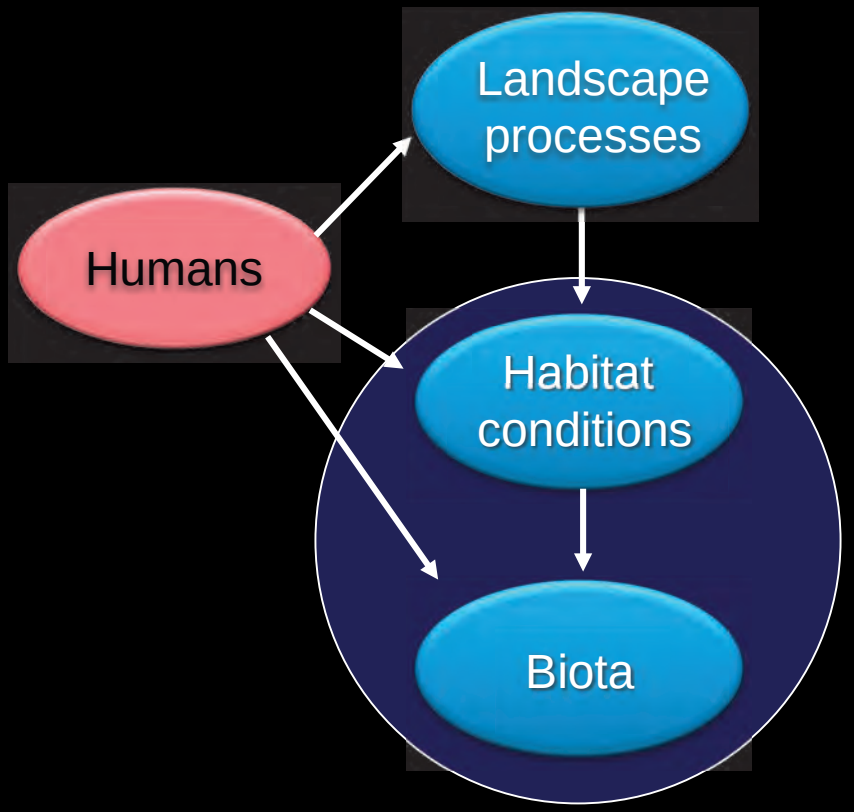
Beechie et al. 2010

How does it influence assessments?

- It helps us focus on the planning questions we need to answer

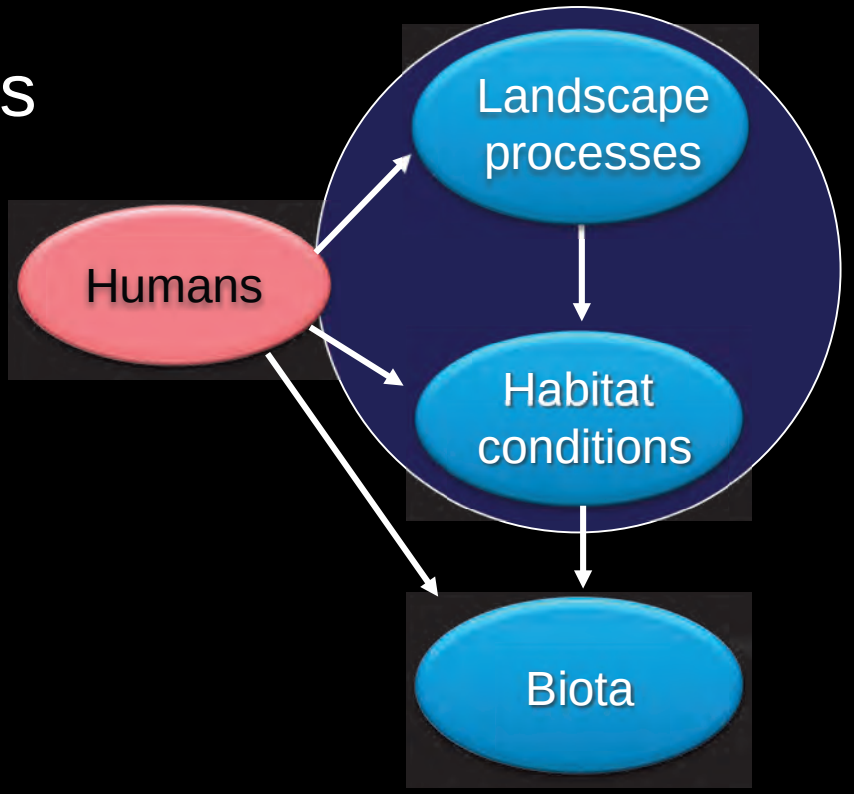
What do we need to know?

- How have habitats changed and altered biota?



What do we need to know?

- What are the root causes of habitat and biological change?
- How have habitats changed and altered biota?



How do we measure change?

- Assess ‘potential’
  - Historical reference
  - Contemporary reference
  - Models/theory
- Assess current condition
  - Relative to ‘potential’

What about the ‘reference’ debate?

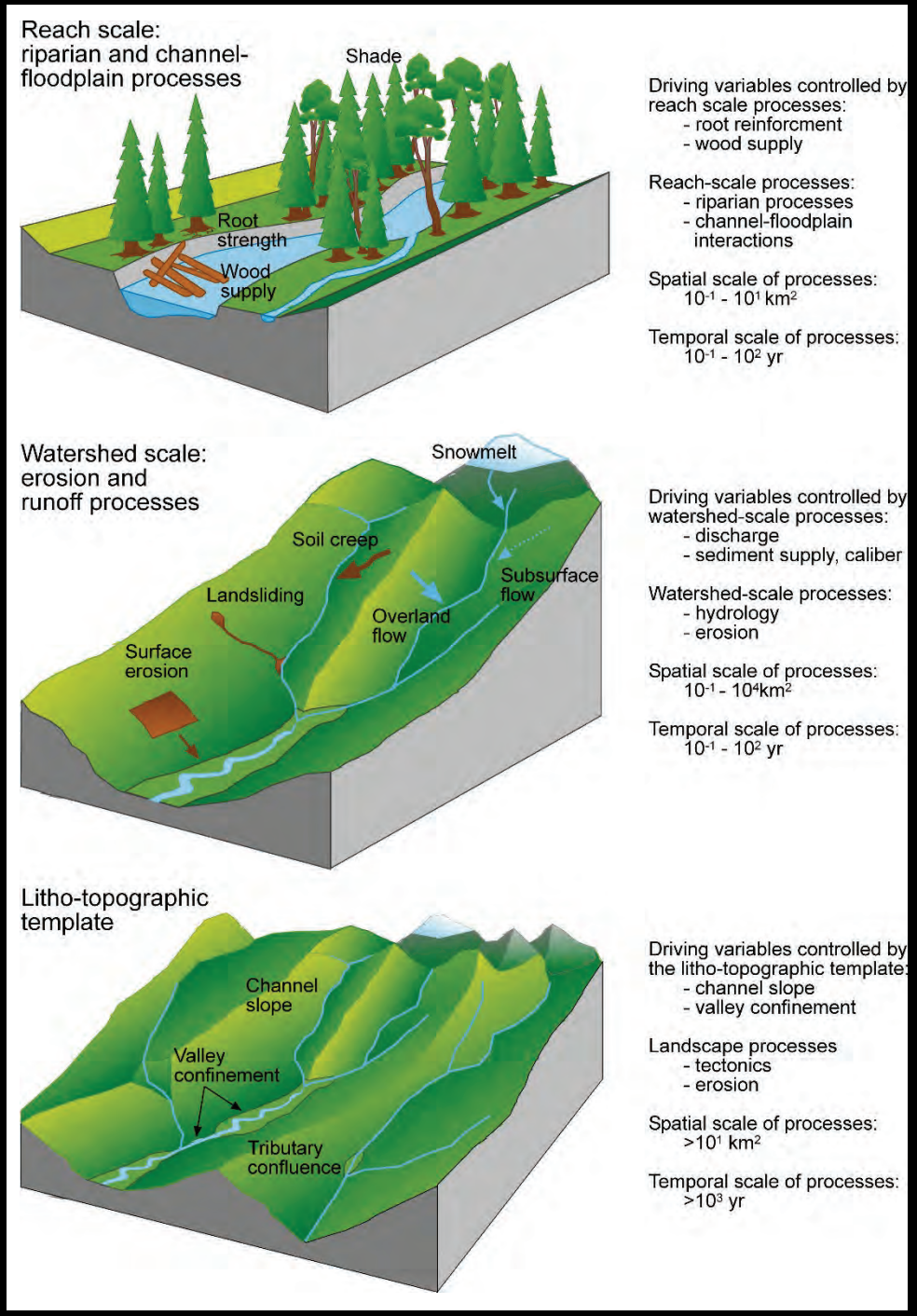
- Arguments against
  - No possibility of achieving historical conditions
  - The reference is irrelevant to our evolving future

- Arguments for
  - The reference is not the target
  - Still our best estimate of potential
  - Past land use effects often larger than predicted climate effects

What about the ‘reference’ debate?

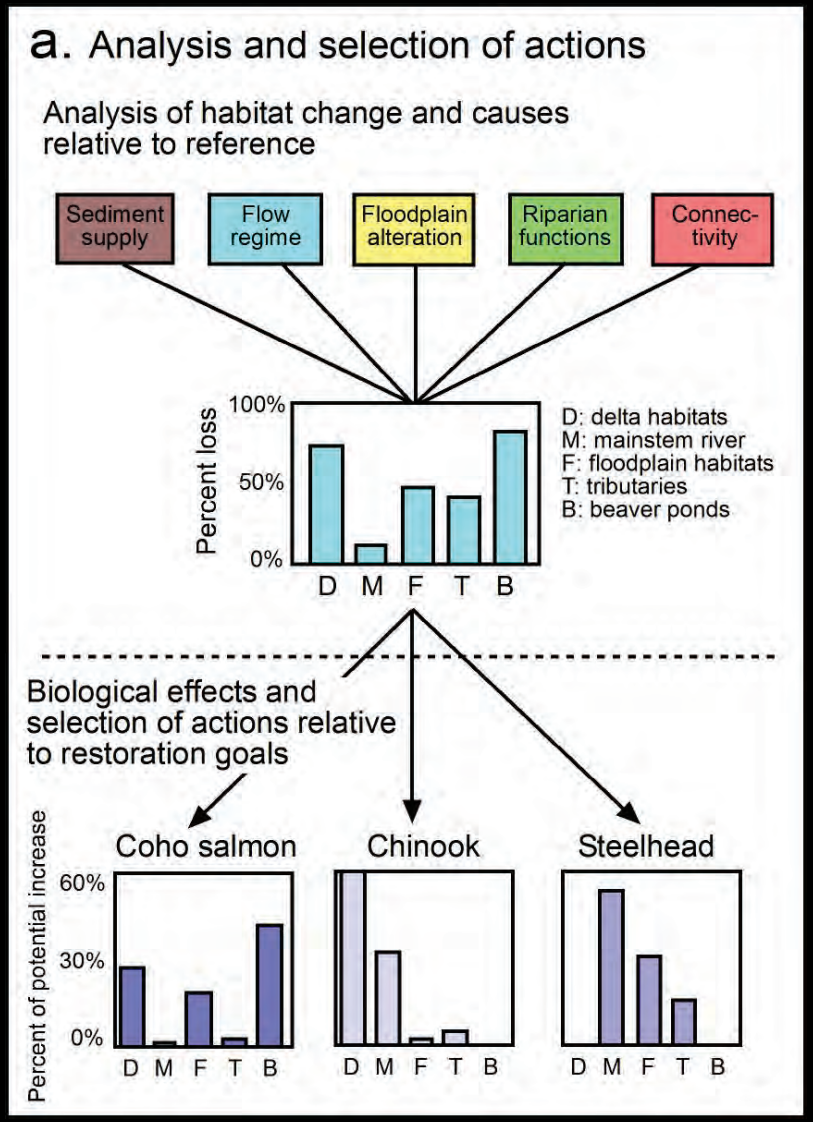
- Agreement on
  - A clear goal or guiding vision is critical
  - Contemporary references are useful

- Reach scale processes
  - Mutable
  - Influences key habitat elements like wood, shade, nutrients
- Watershed-scale processes
  - Mutable
  - Controls key habitat elements: sediment supply and hydrology
- Landscape template
  - Largely immutable
  - Controls the range conditions that can be expressed

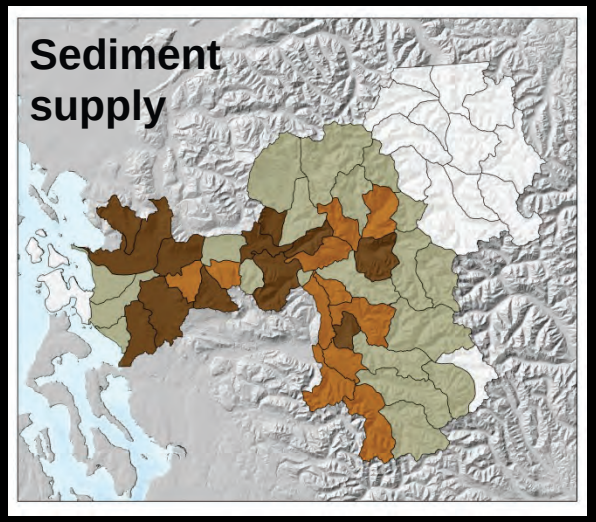


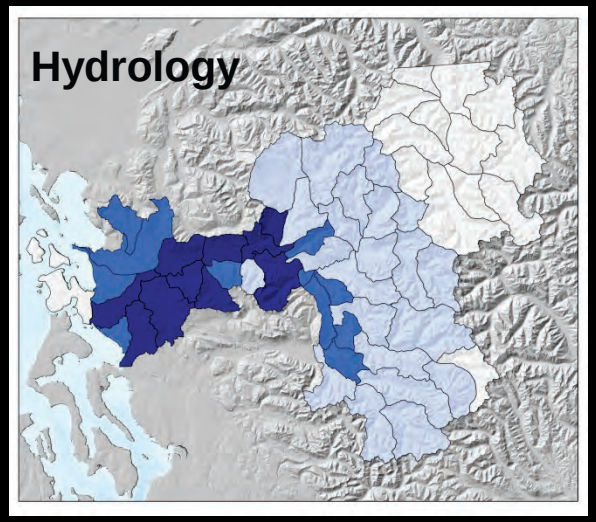
Q1: habitat and species changes

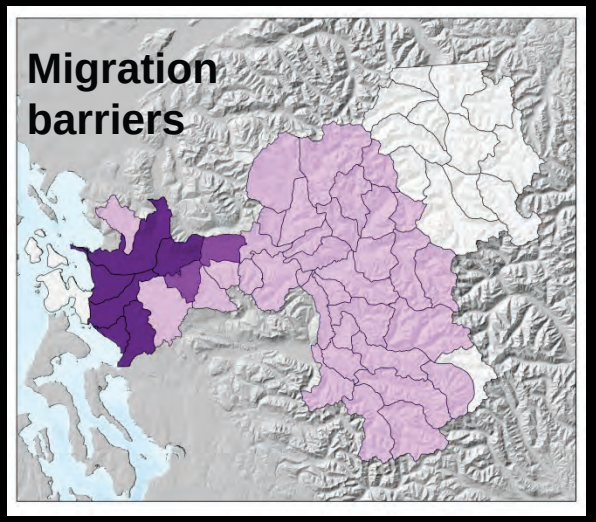
- Summarize habitat changes across the restoration area
- Quantify importance of each habitat loss to species of interest

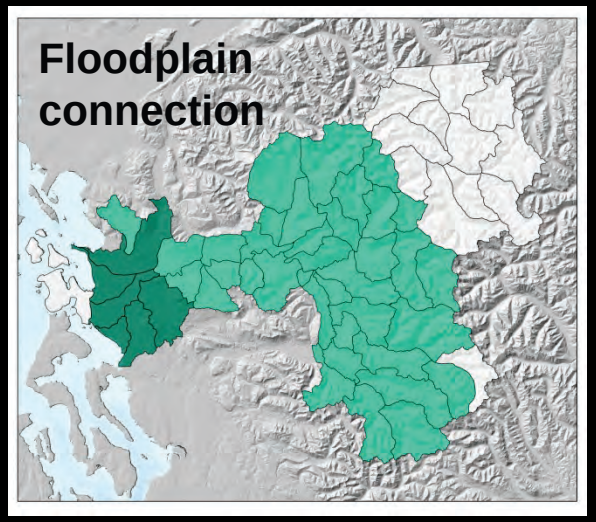


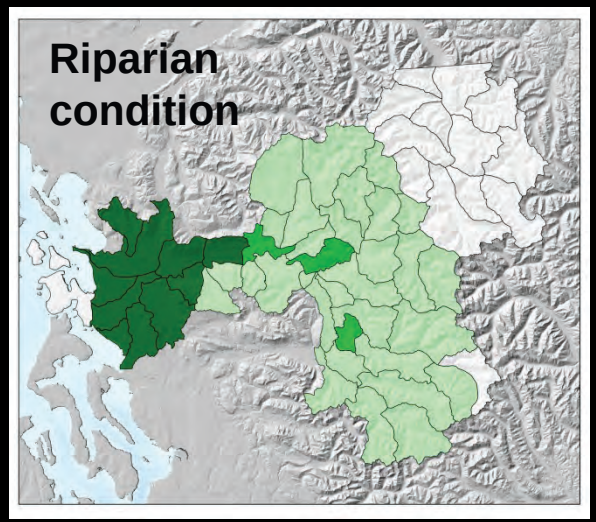
Q2: causal process changes

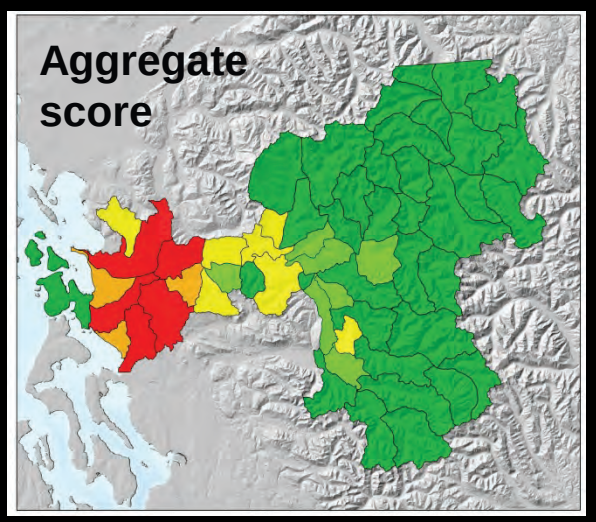




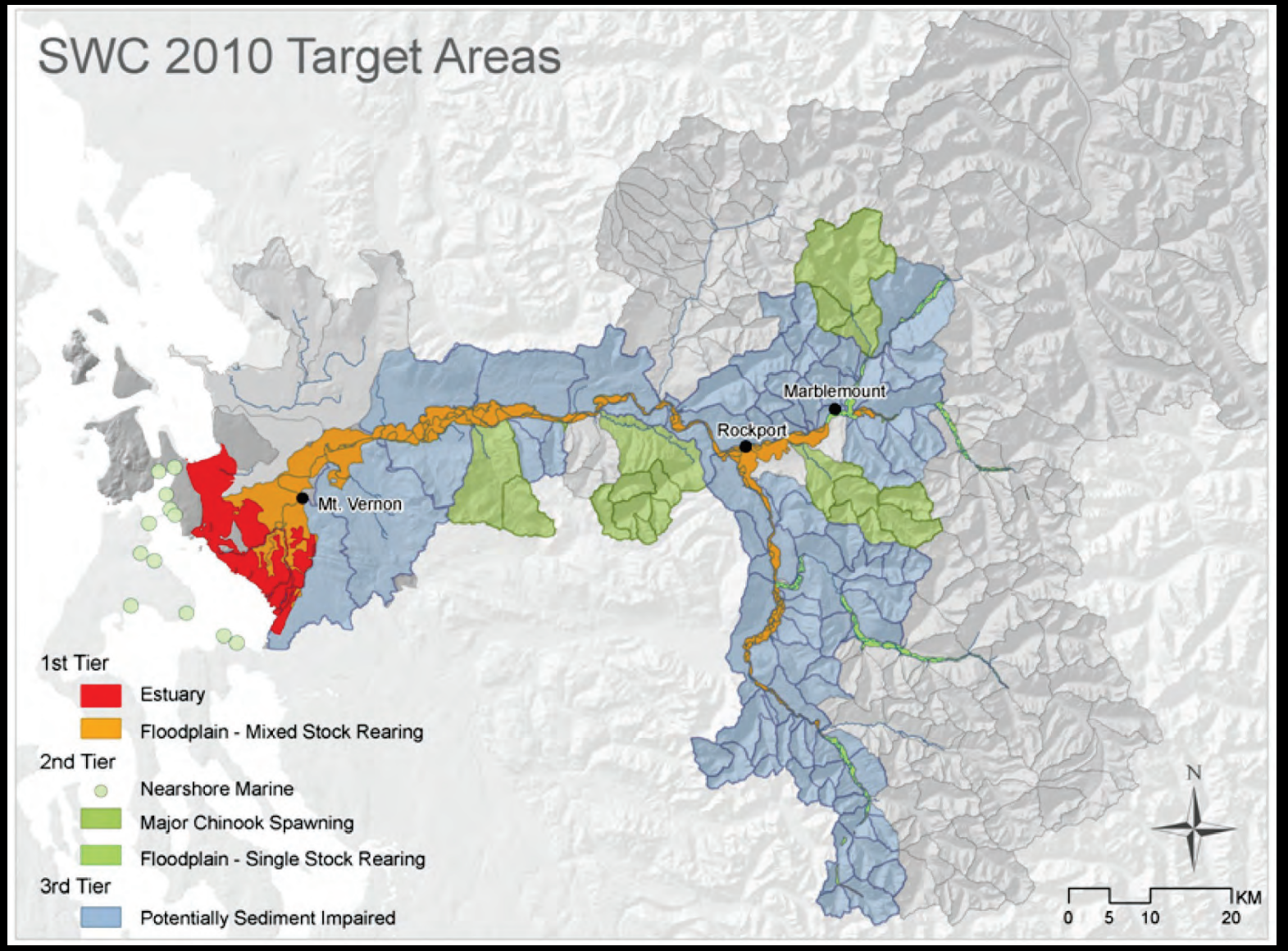








Develop a strategy



If you have multiple priorities

- Look for overlaps
- Look for funding synergies

Closing points

- It’s all about the questions
  - Science questions
  - Policy questions
- Have a clear goal
- Understanding the hierarchy of processes is critical